

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)



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| Applicant's or agent's file reference  | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) |  |
| International application No.<br>PCT/GB 03/03365   | International filing date (day/month/year)<br>01.08.2003   | Priority date (day/month/year)<br>02.08.2002 |
| International Patent Classification (IPC) or both national classification and IPC<br>B01F13/00 |  |  |
| Applicant<br>IMPERIAL COLLEGE INNOVATIONS LIMITED  |  |  |

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.
  - ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of    sheets.

## 3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

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|---|--|
| Date of submission of the demand<br><br>02.03.2004  | Date of completion of this report<br><br>16.12.2004  |
| Name and mailing address of the international preliminary examining authority:<br><br> European Patent Office - P.B. 5818 Patentlaan 2<br>NL-2280 HV Rijswijk - Pays Bas<br>Tel. +31 70 340 - 2040 Tx: 31 651 epo nl<br>Fax: +31 70 340 - 3016 | Authorized Officer<br><br>Real Cabrera, R<br>Telephone No. +31 70 340-4256  |

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/GB 03/03365**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

**Description, Pages**

1-24 as originally filed

**Claims, Numbers**

1-71 as originally filed

**Drawings, Sheets**

1/11-11/11 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/GB 03/03365**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

|                               |             |                                       |
|-------------------------------|-------------|---------------------------------------|
| Novelty (N)                   | Yes: Claims | 9-16,20,24-31,33,34,36,37,49-51,53-71 |
|                               | No: Claims  | 1-8,17-19,21-23,32,35,38-48,52        |
| Inventive step (IS)           | Yes: Claims | -                                     |
|                               | No: Claims  | 1-71                                  |
| Industrial applicability (IA) | Yes: Claims | 1-71                                  |
|                               | No: Claims  | -                                     |

**2. Citations and explanations**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB 03/03365

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1. Reference is made to the following documents:

- D1: EP-A-0 925 827 (USBI CO) 30 June 1999 (1999-06-30)
- D2: GB-A-2 096 911 (SIMPKINS DAVID ROGERS PRICE) 27 October 1982 (1982-10-27)
- D3: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 16, 8 May 2001 (2001-05-08) & JP 2001 018206 A (MITSUI CHEMICALS INC), 23 January 2001 (2001-01-23)
- D4: BERTSCH A ET AL: '3D micromixers - downscaling large scale industrial static mixers' PROCEEDINGS OF THE IEEE 14TH. ANNUAL INTERNATIONAL CONFERENCE ON MICROELECTRO MECHANICAL SYSTEMS. MEMS 2001. INTERLAKEN, SWITZERLAND, JAN. 21 - 25, 2001, IEEE INTERNATIONAL MICRO ELECTRO MECHANICAL SYSTEMS CONFERENCE, NEW YORK, NY: IEEE, US, vol. CONF. 14, 21 January 2001 (2001-01-21), pages 507-510, XP010534659 ISBN: 0-7803-5998-4

2.1 The term "*microchip*" used in the claims is vague and unclear in the light of the cited prior art and leaves the reader in doubt as to the meaning of the needed technical features to which it refers, thereby rendering the definition of the subject-matter of the claims unclear, Article 6 PCT. Therefore, said term cannot be considered when trying to distinguish the claims from the cited prior art documents.

Moreover, the attention of the applicant is drawn to the fact that the mere definition of the apparatus as being a "*microchip*" (i.e. intending to imply that the apparatus has "small" dimensions) does not necessarily imply any specific feature able to solve any specific problem present in the prior art. No features are contained in the claims which could suggest that apparatus such as those disclosed in the cited prior art documents cannot be scaled to the desired dimensions in order to adapt to the processing of higher or lower quantities of products. The downscaling of large scale industrial mixers is known from D4.

2.2 **Claims 5, 6, 22 and 23** do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claims attempt to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

3.1 Furthermore, the above-mentioned lack of clarity notwithstanding (cf. §2.1), the subject-matter of **claim 1** is not new in the sense of Article 33(2) PCT, and therefore the criteria of Article 33(1) PCT are not met.

The document D1 discloses (cf. figure 1) *a powder mixing apparatus, comprising a powder mixing unit for mixing a plurality of powder components to provide a powder mixture, the powder mixing unit including a powder mixing channel (16) in which powder components are mixed on being transported therethrough, a powder outlet port (28) through which the powder mixture is delivered, and a plurality of mixing gas supply channels (38) fluidly connected to the powder mixing channel at spaced locations along a length thereof through which mixing gas flows are delivered to effect mixing of the powder components on being transported through the powder mixing channel.*

3.2 A powder mixing system comprising the apparatus of **claim 1**, as disclosed in **claim 38**, is thus known from D1.

The subject-matter of **claim 38** is therefore not novel (Article 33(2) PCT).

3.3 Furthermore, the above-mentioned lack of clarity notwithstanding (cf. §2.1), the subject-matter of **claim 44** is not new in the sense of Article 33(2) PCT, and therefore the criteria of Article 33(1) PCT are not met.

The document D1 discloses (cf. figure 1) *a powder mixing method, comprising the steps of:*

- *providing a powder mixing apparatus comprising: a powder mixing unit for mixing a plurality of powder components to provide a powder mixture, the powder mixing unit including a powder mixing channel (16) in which powder components are mixed on being transported therethrough;*

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB 03/03365

- *delivering a plurality of powder components (A, B) to the powder mixing channel; and*
- *delivering a plurality of mixing gas flows to the powder mixing channel at spaced locations along a length thereof (38), which mixing gas flows act to mix the powder components during transport through the powder mixing channel.*

4. Dependent **claims 2-37, 39-43 and 45-71** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:
  - 4.1 The additional features of **claims 2, 5-7, 17-19, 21, 32, 35, 39-41, 45-48 and 52** are already disclosed in document D1, cf. figures.
  - 4.2 The additional features of **claims 3, 4, 22, 23 and 42**, in combination with the features of **claims 1, 38 and 44**, are already disclosed in document D2, cf. figures.
  - 4.3 The additional features of **claims 8 and 43**, in combination with the features of **claims 1 and 38**, are already disclosed in document D3, cf. figure.
  - 4.4 The additional features of **claims 9-16, 20, 24-31, 33, 34, 36, 37, 49-51 and 53-71** appear to be obvious for the skilled person.
5. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D4 is not mentioned in the description, nor are these documents identified therein.
6. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).